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UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE

R-3

REPLY TO: 5200 Forest Insect Control

DEC 14 1970

SUBJECT: Southwestern Pine Tip Moth Evaluation - Chevelon RD, Sitgreaves NF

TO: The Files

The following summarizes the 1970 evaluation of the southwestern pine tip moth trend study plots on the Chevelon District, Sitgreaves National Forest.

Plots were established in 1968 and 1969 according to procedures outlined previously.1/ 2/ Evaluations in early 1968 determined the rate of infestation and total height in 1967. On July 21-29, 1970, the plots were re-visited and the trees examined and measured.

Based on data from all 12 plots, no significant difference occurred between percent of terminals infested in 1969 and 1970 ($t = 2.06$ with 11 d.f.). However, the percent of terminals infested in 1970 decreased significantly from the 1969 count on the 9 plots established in 1968 ($t = 4.85$ with 8 d.f.). On these plots, the average percent of infested terminals was 65 in 1967, 68 in 1968, 82 in 1969, and 65 in 1970. Terminal infestations on the 3 plots established in 1969 increased in 1970, but this increase was not significant ($t = 2.11$ with 2 d.f.) (Table 1). Height growth increased slightly in 1970 over that in 1969 (Table 1), but this difference was not significant ($t = 1.05$ with 11 d.f.).

The average height of the 1970 non-infested trees at the end of the 1969 growing season was 53.4 inches and for the 1970 infested trees 48.7 inches (Table 2). Non-infested trees grew an average of 6.6 inches in 1970, while infested seedlings grew an average of 5.2 inches. This difference was not significant, though, when means were adjusted to reflect total height at the beginning of the growing season ($t = 1.67$ with 22 d.f.). This result agrees with that obtained in 1968, but differs from that of 1969. The

1/ Buffam, P. E. and C. J. Germain. 1969. Results-Pilot Control Study. Helicopter application of Cygon (dimethoate) for control of the southwestern pine tip moth, Rhyacionia neomexicana (Dyar). Sitgreaves National Forest, Chevelon District, Region 3. Office Report, Southwestern Region. 8 pp.

2/ Buffam, P. E. 1969. Results of the 1969 evaluation of the southwestern pine tip moth trend study plots. Sitgreaves National Forest, Chevelon District, Region 3. Office Report, Southwestern Region. 4 pp.

Table 1.--Summary of growth and infestation data, southwestern pine tip moth trend plots, Sitgreaves National Forest, Arizona, 1967-70.

Plot	No. trees alive 1970	Ave. total height (inches)				Ave. height growth (inches)			Percent terminals infested			
		1967	1968	1969	1970	1968	1969	1970	1967	1968	1969	1970
2	244	47.6	56.4	62.8	69.9	8.8	6.4	7.1	61.6	63.4	80.5	69.9
3	235	37.1	42.6	46.1	51.7	5.5	3.5	5.6	52.8	72.1	86.9	66.8
4	248	43.0	50.3	56.7	62.2	7.3	6.4	5.5	55.2	70.2	87.1	68.1
6	238	19.4	24.1	27.8	30.8	4.7	3.7	3.0	52.8	59.0	80.1	48.7
7	245	28.6	33.0	36.9	41.2	4.4	3.9	4.3	77.2	84.2	93.1	71.4
8	249	52.7	60.5	67.2	74.7	7.8	6.7	7.5	60.0	50.8	61.8	61.8
11	250	53.8	63.0	70.6	77.7	9.2	7.6	7.1	68.4	67.2	73.6	68.0
13	249	51.1	57.9	64.5	71.6	6.8	6.6	7.1	74.8	65.9	78.2	47.0
14	248	38.9	45.4	50.5	55.4	6.5	5.1	4.9	78.0	81.2	93.5	78.2
Loop Burn	100	-	22.0	29.5	36.8	-	7.5	7.3	-	-	12.0	24.0
George Burn	100	-	9.8	14.5	18.9	-	4.7	4.4	-	-	29.0	51.0
Hatchery Burn	45	-	5.0	6.1	8.9	-	1.1	2.8	-	-	0.0	2.2
	2451	41.21	44.68	50.22	56.14	6.80	5.54	5.92	64.53	68.21	74.98	61.19

Table 2.--Summary of 1970 height growth data by infestation category, southwestern pine tip moth trend plots, Sitgreaves National Forest, Arizona.

	Non-infested			Infested		
Plot	No. trees	Total ht. end of 1969	1970 ht. growth	No. trees	Total ht. end of 1969	1970 ht. growth
2	72	76.8	8.9	172	56.8	6.4
3	78	52.1	5.8	157	43.8	4.8
4	79	64.5	7.3	169	52.8	5.0
6	121	36.4	2.7	116	20.3	2.1
7	70	31.8	3.9	174	39.3	4.3
8	95	74.3	8.6	154	62.8	6.8
11	80	79.0	8.1	170	66.6	6.5
13	132	68.2	8.2	117	59.7	6.4
14	52	69.4	7.6	194	45.5	4.6
Loop Burn	49	15.9	5.2	51	13.4	3.4
George Burn	44	6.2	2.7	1	5.0	1.0
Hatchery Burn	76	29.6	8.0	24	29.4	4.8
Total	948	Ave. 53.38	Ave. 6.55	Total 1499	Ave. 48.68	Ave. 5.19

1970 height growth was directly related to the total height at the end of the 1969 growing season for both non-infested and infested trees ($r = 0.789$ and 0.933, respectively, with 11 d.f.).

Some tree mortality has occurred on most plots since their establishment. No tree kill has been directly attributable to tip moth. Most was caused by animal damage, grass competition, or poor growing conditions. No trees on plot 11 and the Loop Burn and George Burn plots have sustained mortality since plot establishment. Ten percent of the trees on the Hatchery Burn plot died in 1970.

Some plot maintenance will be required in 1971 on the 9 original plots. Car seals should be cut from the bole and replaced with aluminum tags

Paul E. Buffam

PAUL E. BUFFAM
Entomologist
Timber Management

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REPLY TO: 5200 Forest Insect Control

DEC 15 1970

SUBJECT: Southwestern Pine Tip Moth Evaluation - Chevelon RD, Sitgreaves NF

TO: Forest Supervisor, Sitgreaves NF

Enclosed for your information is a letter to the files by entomologist Paul Buffam, summarizing the 1970 southwestern pine tip moth evaluation on the Chevelon District. Three observations are worth mentioning:

1. The percent of infested terminals dropped from 82 in 1969 to 65 in 1970.

2. The difference in height growth between infested and non-infested trees was not significant when averages were adjusted to reflect height at the beginning of the growing season.

3. The infestation has increased significantly on the Loop Burn and George Burn plots, but is still below the overall average.

We plan to continue evaluating these plots until tip moth damage is no longer significant.

for MARK M. JOHANNESEN
Assistant Regional Forester
Timber Management

Enclosure

cc: WO
WO Div. FI&DR (2)
RM, Ft. Collins
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